Efficacy Review

Date: August 17, 2010

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8-17-10

Risk Manager Rev.: Linda DeLuise

Products: 5 FMC granular products

A.I.(s): Bifenthrin (0.20%), Zeta-Cypermethrin (0.05%)

EPA Reg. #:
279-3346
279-3343
279-3344
279-3345
279-3342

Decision #s:
433829
433828
433830
433831
433832

DP #s:
378501
378498
378500
378499
378497

Submission: R340, Amendment, Non-fast-track, RD Science Review

MRIDs:
Submitted: 48101601
Cited: 44021901, 44137401, 44137402, 44891902, 45298601, 46186401, 46508101, 47086001, 47361711, 47385709

GLP: No

MRID 48101601

Title: Efficacy of F6132 and F6133 against Fire Ant Mounds

Guideline: OPPTS 810.3100

Materials and Methods: The applicant has submitted data from field studies where ant mound control, and speed of control was evaluated using 2 formulations of a granule product identical in active ingredient concentration to the submitted products. Tests were conducted at three field sites (GA, FL, AL) in fields with active imported fire ant activity. Evaluation of the mounds was done using 3/8" wooden dowels placed 3" into the mound for 15 seconds, with counting of ants on the dowel. For prequalification, mounds with less than 30 live ants were excluded from the study. In GA 14 mounds were treated and only one formulation was tested vs. a control. In FL and AL, 30 mounds were treated for each formulation and control (3 plots of 10 mounds in each group). Treated mounds were dosed with the granules at the label rate (1/2 cup per mound) and watered in using a gallon of water dispensed from a sprinkling can. Ant measurements were taken for pre-treatment, 2 minutes post-treatment, and 4 hours post-treatment. % control was calculated using Abbott's formula

Study Summary of the Results:

1. In the Georgia trial, 100% mound mortality was observed within 15 minutes of treatment.
2. In the Florida and Alabama trials, >90% mound mortality was observed for both formulations within 4 hours of treatment.

Entomologist's Observations/Discussion:

Claims against imported fire ants are supported, including claims against controlling the mound, killing the queen, and control of mounds within 4 hours of treatment.

MRID 44021901

Title: Efficacy of Broadcast Applications of Bifenthrin Granular Formulations for Imported Fire Ant Control in Turfgrass and Electrical Transformers

Materials and Methods: Various

Guideline: OPPTS 810.3100

Study Summary of the Results:

The MRID summarizes a number of USDA and University studies that evaluated various Bifenthrin 0.2% granular products at various use rates and conditions. Alate queens were controlled 4 months after application of granules at the rate of 0.25 lbs ai/acre.

Entomologist's Observations/Discussion:

1. Studies evaluating applications greater than 0.25 lbs ai/acre are not valid for supporting the submitted label claims against fire ants, because the product limits application to 0.25 lbs ai/acre for applications in residential settings. Therefore, the fire ant control claim must be reduced to 4 months, based on the results of the Wiggins, Mississippi (1990) study that showed 100% control (alate queen bioassay) 4 months after application. In order to support a 6 month claim, the applicant would need to submit data demonstrating efficacy at 6 months using the 0.25 lbs ai/acre application rate.

2. Therefore also, for fire ants application rates under the Directions for Use, the minimum rate of product per acre must be increased from 100 lbs to 125 lbs, to match the minimum amount of a.i./acre that supports this claim (0.25 lbs ai)

3. Claims are adequately supported for mound drench and pad mounted electrical sites.

MRID 44137401

Title: Efficacy of Broadcast applications of Bifenthrin Liquid and Granular Formulations for Deer Ticks (*Ixodes sp.*) Control in Turfgrass

Materials and Methods: Bucket test with bermudagrass sod that was treated at the rate of 0.2 and 0.4 lb ai/acre, and watered in with the equivalent of ½" of rain. Deer tick nymphs were added to the arena and exposed for 48 hours. Chlorpyrifos was used as a positive control.

Guideline: OPPTS 810.3500

Study Summary of the Results:

Both rates provided 100% control of deer ticks

Entomologist's Observations/Discussion:

4. Claims for Deer Ticks (or "Ticks, including ticks that may transmit Lyme Disease") are adequately supported.

MRID 44137402

Title: Efficacy of Broadcast applications of Bifenthrin Liquid and Granular Formulations for American Dog Tick (*Dermacentor variabilis*) Control in Turfgrass

Materials and Methods: Bucket test with bermudagrass sod that was treated at the rate of 0.2 and 0.4 lb ai/acre, and watered in with the equivalent of ½" of rain. American Dog Ticks (adults

and nymphs_ were added to the arena and exposed for 48 hours. Chlorpyrifos was used as a positive control.

Guideline: OPPTS 810.3500

Study Summary of the Results:

Both rates provided 100% control of deer ticks

Entomologist's Observations/Discussion:

5. Claims for American Dog Ticks (or "Ticks, including ticks that may transmit Rocky Mountain Spotted Fever") are adequately supported.

MRID 44891902

Title: Efficacy of Broadcast Applications of Bifenthrin Liquid and Granular Formulations to Turfgrass for Cat Flea Larval and Adult Control

Materials and Methods: Field trial (arena not specified), where fleas were exposed to treated turfgrass 1 day after application. Sod was treated at the rate of 0.2 and 0.4 lb ai/acre.

Guideline: OPPTS 810.3500

Study Summary of the Results:

Both rates provided 100% control of fleas 1 day and 7 days after treatment

Entomologist's Observations/Discussion:

6. Control claims are supported for fleas (adults and larvae), but should be qualified to say 'control for up to 7 days.'

MRID 45298601

Title: Efficacy of Broadcast Applications of Bifenthrin Granular Formulations for Insect Control in Turfgrass

Pests: (applicable to this amendment application and not covered by other studies): Scorpions

Materials and Methods: Not specified

Guideline: OPPTS 810.3500

Study Summary of the Results:

Study is superseded by MRID 46186401

Entomologist's Observations/Discussion:

N/A: This study is superseded by another

MRID 46186401

Title: Efficacy of FMC 54800 Granules for Control of Scorpions and Chiggers

Materials and Methods: Laboratory assay using adult Striped Scorpions (*Centuroides vittatus*) were exposed to soil treated with granular bifenthrin (for 72 hours) at a rate equivalent to 0.4lbs ai/acre

Guideline: OPPTS 810.3500

Study Summary of the Results:

Scorpions exposed to the treated soil were dead by 72 hours after treatment and 90% did not recover after 7 days.

Entomologist's Observations/Discussion:

7. Studies evaluating applications greater than 0.25 lbs ai/acre are not valid for supporting the submitted label claims against fire ants, because the product limits application to 0.25 lbs ai/acre for applications in residential settings. Therefore this study does not support the submitted label claims for scorpions.
8. Furthrmore, because exposure of scorpions was forced for 72 hours, the study did not approximate typical use conditions for such a product, as scorpions would likely only travel over treated soil perimeter areas for short times.
9. Forced exposure of arthropods for 24 is not the best representation of real-world arthropod exposure scenarios. Since the review of the initial data, OPP's Pesticide Efficacy Review Committee has adopted a five minute standard for exposure of arthropods to treated surfaces, prior to removal to clean containers for morality assessment. The five minute exposure is a more realistic simulation of actual pest biology, where crawling arthropods, especially foraging ants, for example, will cross treated surfaces but may not remain for an extended period of time. On a case-by-case basis, efficacy reviewers will consider data with longer exposures, depending upon the chemical's mode of action (some are more slow acting than pyrethroids, for example), pest biology, and other scientific considerations. However, data with 24 hours of forced exposure is not an acceptable test duration for the listed pests for typical indoor surface treatments like those described on the product label (i.e., not crack and crevice, where exposure could be longer).
10. This data set does not support any residual claims against scorpions.

MRID 46508101

Title: Efficacy of FMC 54800 Granular Pesticide for Control of Scorpions

Materials and Methods: Laboratory assay using adult Striped Scorpions (*Centuroides vittatus*) were exposed to soil treated with granular bifenthrin (for 24 hours) at a rate equivalent to 0.2 lbs ai/acre.

Guideline: OPPTS 810.3500

Study Summary of the Results:

95% of scorpions exposed to the treated soil were knocked down within 4 hours, with no recovery observed, but remained exposed to the treated surface for 24 hours. 100% mortality was observed for exposed scorpions, with no recovery after 7 days.

Scorpions exposed

Entomologist's Observations/Discussion:

1. Because exposure of scorpions was forced for 24 hours, the study did not approximate typical use conditions for such a product, as scorpions would likely only travel over treated soil perimeter areas for short times.
2. Forced exposure of arthropods for 24 is not the best representation of real-world arthropod exposure scenarios. Since the review of the initial data, OPP's Pesticide Efficacy Review Committee has adopted a five minute standard for exposure of arthropods to treated surfaces, prior to removal to clean containers for morality assessment. The five minute exposure is a more realistic simulation of actual pest biology, where crawling arthropods, especially foraging ants, for example, will cross treated surfaces but may not remain for an extended period of time. On a case-by-case basis, efficacy reviewers will consider data with longer exposures, depending upon the chemical's mode of action (some are more slow acting than pyrethroids, for example), pest biology, and other scientific considerations. However, data with 24 hours of forced exposure is not an acceptable test duration for the listed pests for typical indoor surface treatments like those described on the product label (i.e., not crack and crevice, where exposure could be longer).
3. This data set does not support any residual claims against scorpions.

MRID 47086001

Title: Residual Control of Bifenthrin Granules

Purpose/Objectives:

Materials and Methods:

Guideline: OPPTS 810.3500

Species: Red imported fire ant, *Solenopsis invicta*

Test material: Bifenthrin granules

Design: Outdoor trials with caged forced exposure of insects to treated areas.

Dosages: 0.2 lbs ai/acre

Data collection: Various

Statistics: Summary only

Study Summary of the Results:

Control of foraging red imported fire ant outdoors (on soil) was supported for up to 148 days after treatment, when applying a granule at 0.2 lbs ai/acre.

Entomologist's Observations/Discussion:

11. Insufficient detail was provided on the length of forced exposure of fire ants to the treated surfaces. Generally a 5 minute forced exposure period is required, after which, insects are removed to a clean container for evaluation of mortality after 24 hours. The methodology for forced exposure was not provided and this is of particular importance because the use of this product for outdoor application would only be for small bands 'along the foundation, around window frames and doorways, on porches and patios, in garages, [and] along eaves and exterior siding. These are all surfaces which differ significantly from application of a granule to soil, and for which separate residual efficacy data needs to be submitted where forced insect exposure is five minutes, after which insects are removed for knockdown/mortality assessments.
12. Claims for control of foraging fire ants and associated barrier claims related to outdoor applications are not supported, but this data is superseded by aforementioned studies

MRID 47361711

Title: Efficacy of Zeta-cypermethrin for Control of Variety of Public Health Pests

Materials and Methods: Various

Guideline: OPPTS 810.3500

Study Summary of the Results:

N/A

Entomologist's Observations/Discussion:

Studies evaluating Fire ant mound and broadcast data are provided, but efficacy results are superseded by the superior performance observed in the aforementioned bifentrhin studies, MRID 44021901.

MRID 47385709

Title: Fire Ant Mound Control using F6570 EW Formulation

Materials and Methods: Various

Guideline: OPPTS 810.3100

Study Summary of the Results:

N/A

Entomologist's Observations/Discussion:

Studies evaluating Fire ant mound and broadcast data are provided, but efficacy results are superseded by the superior performance observed in the aforementioned bifentrhin studies.

Overall Review of Label Claims:

279-3346: Claims against Ants (except Carpenter and Pharaoh ants), Fleas, Imported Fire Ants, and Ticks are acceptable. Claims against scorpions (any and all species) are not acceptable and must be removed from the label. Specific pest instruction amendments for ants, flea larvae, and ticks are acceptable. The instructions for scorpions are not acceptable and must be removed.

The following marketing claims are unacceptable and must be removed from the label:

a. "Invisishield Bug Barrier" or "Invisishield Technology"
b. "Kills Insects, Fleas, & Ticks" must be revised to "Kills listed insects, fleas, & ticks."
c. "Kills most outdoor pests in lawns and around homes" must read "kills listed outdoor pests . . ."
d. "Kills pests on contact." Kills "by contact" or "through contact" would be acceptable.
e. "Corrects most lawn insect problems" and "Controls many lawn insect problems."
f. "Kills 100+ insects" must be revised to include "as listed."
g. "One application keeps killing lawn bugs for an entire season" or "Season long control" Because seasonal claims vary by market, only a "3 month" duration is allowed.

h. "Kills in minutes", "Kills seconds after contact". These claims are not supported. The claim "starts killing immediately upon contact" would be acceptable as an alternative.

279-3342: Claims against Ants (except Carpenter and Pharaoh ants), Fleas, Imported Fire Ants, and Ticks are acceptable. Claims against scorpions (any and all species) are not acceptable and must be removed from the label. Specific pest instruction amendments for fleas, imported fire ants, and ticks are acceptable. The instructions for scorpions are not acceptable and must be removed. Spot treatment directions for fire ant mound treatments, broadcast spot treatments, and pad mounted electrical sites are acceptable.

279-3343: Claims against scorpions (any and all species) are not acceptable and must be removed from the label. Claims against killing imported fire ant mounds within four hours and killing the queen within 24 hours are acceptable. The instructions for scorpions are not acceptable and must be removed.

279-3344: Claims against Ants (except Carpenter and Pharaoh ants), Fleas, Imported Fire Ants, and Ticks are acceptable. Claims against scorpions (any and all species) are not acceptable and must be removed from the label. Specific pest instruction amendments for fleas, imported fire ants, and ticks are acceptable. The instructions for scorpions are not acceptable and must be removed. Spot treatment directions for fire ant mound treatments, broadcast spot treatments, and pad mounted electrical sites are acceptable.

279-3345: Claims against Ants (except Carpenter and Pharaoh ants), Fleas, Imported Fire Ants, and Ticks are acceptable. Claims against scorpions (any and all species) are not acceptable and must be removed from the label. Specific pest instruction amendments for fleas, imported fire ants, and ticks are acceptable. The instructions for scorpions are not acceptable and must be removed. Spot treatment directions for fire ant mound treatments, broadcast spot treatments, and pad mounted electrical sites are acceptable.